

## PROLOGO

En este libro podrán encontrar solución a los ejercicios del algebra de Baldor, no busco dinero solo ayudar a las personas por medio de la escritura y en este caso a personas que buscan solución a los ejercicios, por supuesto con ayuda de otros profesionales en el área de matemáticas debido a que no conozco mucho del tema.

En lo principal sigo en la búsqueda de un premio importante de la escritura, mi nombre es inmortal gracias a las bibliotecas de diferentes países que guardan algunos de mis escritos para la historia, obtuve premios gracias a concursos y a una editorial, todo gracias a personas de buen corazón.

Espero que este libro le sea de utilidad, recuerde que el tiempo es muy valioso y corre en nuestra contra, intente disfrutar cada instante.

## EJERCICIOS RESUELTOS

### EJERCICIO 1

1. Una deuda se expresa en sentido negativo. Luego inicialmente el estado económico de Pedro es - 80 bs.

Al recibir 320 bs. Aumenta su capital tantos bs. como ha recibido; entonces la operación queda expresada como se indica

$$-80 + 320 = +240 \text{ bs.}$$

2.  $1.170 - 1.515 = -345$  sucres

3.  $200 + 56 - 189 = +\$67$

4.  $-685 - 1.178 + 2.280 = +437$  soles

5.  $20 - 15 + 40 - 75 = -\$30$

6.  $-67 + 72 - 16 + 2 = -\$9$

7.  $200 - 78 - 81 - 93 + 41 - 59 = -70$  colones

8.  $-45 - 66 - 79 + 200 - 10 = 0$

### EJERCICIO 2

1.  $12 - 15 = -3^\circ$

2.  $-3 + 8 - 6 = -1^\circ$

3.  $15 - (-3) = 15 + 3 = 18^\circ$

4.  $-(-8) + 5 = 8 + 5 = 13^\circ$

5.  $-4 + 7 + 2 - 11 = -6^\circ$

6.  $-8 + 4 \cdot 1 = -8 + 4 = -4^\circ \rightarrow 7 \text{ am}$

$$-8 + 4 \cdot 2 = -8 + 8 = 0^\circ \rightarrow 8 \text{ am}$$

$$-8 + 4 \cdot 5 = -8 + 20 = +12^\circ \rightarrow 11 \text{ am}$$

7.  $-1 - 2 \cdot 2 = -1 - 4 = -5^\circ \rightarrow 10 \text{ am}$

$$-1 - 2 \cdot 3 = -1 - 6 = -7^\circ \rightarrow 11 \text{ am}$$

$$-1 - 2 \cdot 3 + 3 \cdot 1 = -1 - 6 + 3 = -4^\circ \rightarrow 12 \text{ am}$$

$$-1 - 2 \cdot 3 + 3 \cdot 3 = -1 - 6 + 9 = +2^\circ \rightarrow 2 \text{ pm}$$

8.  $-56 + 7 = -49^\circ$

9.  $-71 + 5 = -66^\circ$  long

$$-15 + (-5) = -20^\circ$$
 lat.

10.  $18 + 3 = +21^\circ$  long

$$65 - 4 = +61^\circ$$
 lat.

11.  $-75 + 135 = +60$  años

### EJERCICIO 3

1.  $+32 \text{ m}; -16 \text{ m}$

2.  $+10 \text{ m}; -4 \text{ m}$

3.  $50 - 85 = -35 \text{ m}$

4.  $-6 \cdot 11 = -66 \text{ m}$

5.  $-8 \times 6 = -48 \text{ m}$

$$9 \times 6 = +54 \text{ m}$$

6.  $400 \cdot 2 = +800 \text{ m} \rightarrow$  corredor

$$-400 \cdot 3 = -1.200 \text{ m} \rightarrow$$
 yo

7. Los 40 pies de longitud del poste se reparten así: 15 pies que sobresalen - se asumen en sentido positivo - .

25 pies que se encuentran enterrados.

- se asumen en sentido negativo - .

Al introducir 3 pies más, se adicionan a los que están bajo el suelo y se deben descontar de los que están por encima.

Aritméticamente significa:

$$40 = 15 + 25$$

$$-25 - 3 = -28 \text{ pies}$$

$$+15 - 3 = +12 \text{ pies}$$

8.  $55 - 52 = +3 \text{ m}$

9.  $-32 + 15 = -17 \text{ m}$

10.  $35 - 47 = -12 \text{ m}$

11.  $-39 + 56 = +17 \text{ m}$

12.  $90 - 58 - 36 = -4 \text{ m}$

13.  $72 - 30 \cdot 1 = 72 - 30 = +42 \text{ m}$

$$72 - 30 \cdot 2 = 72 - 60 = +12 \text{ m}$$

$$72 - 30 \cdot 3 = 72 - 90 = -18 \text{ m}$$

$$72 - 30 \cdot 4 = 72 - 120 = -48 \text{ m}$$

14.  $-120 - (-60) \cdot 1 = -120 + 60 = -60 \text{ Km}$

$$-120 - (-60) \cdot 2 = -120 + 120 = 0$$

$$-120 - (-60) \cdot 3 = -120 + 180 = +60 \text{ Km}$$

$$-120 - (-60) \cdot 4 = -120 + 240 = +120 \text{ Km}$$

## EJERCICIO 7.

1.  $x+2x=3x$

2.  $8a+9a=17a$

3.  $11b+9b=20b$

4.  $-b-5b=-6b$

5.  $-8m-m=-9m$

6.  $-9m-7m=-16m$

7.  $4a^2+5a^2=9a^2$

8.  $6a^{x+1}+8a^{x+1}=14a^{x+1}$

9.  $-m^{x+1}-5m^{x+1}=-6m^{x+1}$

10.  $-3a^{x-2}-a^{x-2}=-4a^{x-2}$

11.  $\frac{1}{2}a+\frac{1}{2}a=\frac{1+1}{2}a=\frac{2}{2}a=a$

12.  $\frac{3}{5}ab+\frac{1}{10}ab=\frac{6ab+ab}{10}=\frac{7}{10}ab$

13.  $\frac{1}{3}xy+\frac{1}{6}xy=\frac{2+1}{6}xy=\frac{3}{6}xy=\frac{1}{2}xy$

14.  $-\frac{1}{5}xy-\frac{4}{5}xy=\frac{-1-4}{5}xy=-\frac{5}{5}xy=-xy$

15.  $-\frac{5}{8}a^2b-\frac{1}{8}a^2b=\frac{-20-3}{24}a^2b=-\frac{23}{24}a^2b$

16.  $-a-\frac{7}{8}a=\frac{-8-7}{8}a=-\frac{15}{8}a$

17.  $8a+9a+6a=23a$

18.  $15x+20x+x=36x$

19.  $-7m-8m-9m=-24m$

20.  $-a^2b-a^2b-3a^2b=-5a^2b$

21.  $a^2+3a^2+8a^2=12a^2$

22.  $-5a^{x+1}-3a^{x+1}-5a^{x+1}=-13a^{x+1}$

23.  $a+\frac{1}{2}a+\frac{2}{3}a=\frac{6+3+4}{6}a=\frac{13}{6}a$

24.  $-x-\frac{2}{3}x-\frac{1}{6}x=\frac{-6-4-1}{6}x=-\frac{11}{6}x$

25.  $\frac{1}{5}ax+\frac{3}{10}ax+ax=\frac{2+3+10}{10}ax=\frac{15}{10}ax=\frac{3}{2}ax$

26.  $-\frac{3}{4}a^2x-\frac{5}{6}a^2x-a^2x=\frac{-9-10-12}{12}a^2x=-\frac{31}{12}a^2x$

27.  $11a+8a+9a+11a=39a$

28.  $m^{x+1}+3m^{x+1}+4m^{x+1}+6m^{x+1}=14m^{x+1}$

29.  $-x^2y-8x^2y-9x^2y-20x^2y=-38x^2y$

30.  $-3a^m-5a^m-6a^m-9a^m=-23a^m$

31.  $\frac{1}{2}a+\frac{1}{4}a+\frac{1}{8}a+a=\frac{4+2+1+8}{8}a=\frac{15}{8}a$

32.  $\frac{2}{5}ax+\frac{1}{2}ax+\frac{1}{10}ax+\frac{1}{20}ax=\frac{8+10+2+1}{20}ax=\frac{21}{20}ax$

33.  $0,5m+0,6m+0,7m+0,8m=2,6m$

34.  $-\frac{1}{7}ab-\frac{1}{14}ab-\frac{1}{28}ab-ab$   
 $=\frac{-4-2-1-28}{28}ab=-\frac{35}{28}ab=-\frac{5}{4}ab$

35.  $-\frac{2}{3}x^2y-\frac{1}{6}x^2y-\frac{1}{9}x^2y-\frac{1}{12}x^2y$   
 $=\frac{-24-6-4-3}{36}x^2y=-\frac{37}{36}x^2y$

36.  $ab^2+ab^2+7ab^2+9ab^2+21ab^2=38ab^2$

37.  $-m-m-8m-7m-3m=-20m$

38.  $-x^{x+1}-8x^{x+1}-4x^{x+1}-5x^{x+1}-x^{x+1}=-19x^{x+1}$

39.  $\frac{1}{2}a+\frac{1}{3}a+\frac{1}{4}a+\frac{1}{5}a+\frac{1}{6}a$   
 $=\frac{30+20+15+12+10}{60}a=\frac{87}{60}a=\frac{29}{20}a$

40.  $-\frac{1}{3}ab-\frac{1}{6}ab-\frac{1}{2}ab-\frac{1}{12}ab-\frac{1}{9}ab$   
 $=\frac{-12-6-18-3-4}{36}ab=-\frac{43}{36}ab$

## EJERCICIO 8

1.  $8a-6a=2a$

2.  $6a-8a=-2a$

3.  $9ab-15ab=-6ab$

4.  $15ab-9ab=6ab$

5.  $2a-2a=0$

6.  $-7b+7b=0$

7.  $-14xy+32xy=18xy$

$$8. -25x^2y + 32x^2y = 7x^2y$$

$$9. 40x^2y - 51x^2y = -11x^2y$$

$$10. -m^2n + 6m^2n = 5m^2n$$

$$11. -15xy + 40xy = 25xy$$

$$12. 55a^3b^2 - 81a^3b^2 = -26a^3b^2$$

$$13. -x^2y + x^2y = 0$$

$$14. -9ab^2 + 9ab^2 = 0$$

$$15. 7x^2y - 7x^2y = 0$$

$$16. -101mn + 118mn = 17mn$$

$$17. 502ab - 405ab = 97ab$$

$$18. -1024x + 1018x = -6x$$

$$19. -15ab + 15ab = 0$$

$$20. \frac{1}{2}a - \frac{3}{4}a = \frac{2-3}{4}a = -\frac{1}{4}a$$

$$21. \frac{3}{4}a - \frac{1}{2}a = \frac{3-2}{4}a = \frac{1}{4}a$$

$$22. \frac{5}{6}a^2b - \frac{5}{12}a^2b = \frac{10-5}{12}a^2b = \frac{5}{12}a^2b$$

$$23. -\frac{4}{7}x^2y + \frac{9}{14}x^2y = \frac{-8+9}{14}x^2y = \frac{1}{14}x^2y$$

$$24. \frac{3}{8}am - \frac{5}{4}am = \frac{3-10}{8}am = -\frac{7}{8}am$$

$$25. -am + \frac{3}{5}am = \frac{-5+3}{5}am = -\frac{2}{5}am$$

$$26. \frac{5}{6}mn - \frac{7}{8}mn = \frac{20-21}{24}mn = -\frac{1}{24}mn$$

$$27. -a^2b + \frac{3}{11}a^2b = \frac{-11+3}{11}a^2b = -\frac{8}{11}a^2b$$

$$28. 3,4a^4b^3 - 5,6a^4b^3 = -2,2a^4b^3$$

$$29. -12yz + 3,4yz = 2,2yz$$

$$30. 4a^2 - 2a^2 = 2a^2$$

$$31. -8a^{x+1} + 8a^{x+1} = 0$$

$$32. 25m^{a-1} - 32m^{a-1} = -7m^{a-1}$$

$$33. -x^{a+1} + x^{a+1} = 0$$

$$34. -\frac{1}{4}a^{m-2} + \frac{1}{2}a^{m-2} = \frac{-1+2}{4}a^{m-2} = \frac{1}{4}a^{m-2}$$

$$35. \frac{5}{6}a^{m-1} - \frac{7}{12}a^{m-1} = \frac{10-7}{12}a^{m-1} = \frac{3}{12}a^{m-1} = \frac{1}{4}a^{m-1}$$

$$36. 4a^2 - \frac{1}{3}a^2 = \frac{12-1}{3}a^2 = \frac{11}{3}a^2$$

$$37. -5mn + \frac{3}{4}mn = \frac{-20+3}{4}mn = -\frac{17}{4}mn$$

$$38. 8a^{x+2}b^{x+3} - 25a^{x+2}b^{x+3} = -17a^{x+2}b^{x+3}$$

$$39. -\frac{7}{8}a^m b^n + a^m b^n = \frac{-7+8}{8}a^m b^n = \frac{1}{8}a^m b^n$$

$$40. 0,85mxy - 0,5mxy = 0,35mxy$$

### EJERCICIO 9

$$1. 9a - 3a + 5a = 11a$$

$$2. -8x + 9x - x = 0$$

$$3. 12mn - 23mn - 5mn = -16mn$$

$$4. -x + 19x - 18x = 0$$

$$5. 19m - 10m + 6m = 15m$$

$$6. -11ab - 15ab + 26ab = 0$$

$$7. -5a^x + 9a^x - 35a^x = -31a^x$$

$$8. -24a^{x+2} - 15a^{x+2} + 39a^{x+2} = 0$$

$$9. \frac{2}{3}y + \frac{1}{3}y - y = \frac{2+1-3}{3}y = \frac{0}{3}y = 0$$

$$10. -\frac{3}{5}m + \frac{1}{4}m - \frac{1}{2}m = \frac{-12+5-10}{20}m = -\frac{17}{20}m$$

$$11. \frac{3}{8}a^2b + \frac{1}{4}a^2b - a^2b = \frac{3+2-8}{8}a^2b = -\frac{3}{8}a^2b$$

$$12. -a + 8a + 9a - 15a = a$$

$$13. 7ab - 11ab + 20ab - 31ab = -15ab$$

$$14. 25x^2 - 50x^2 + 11x^2 + 14x^2 = 0$$

$$15. -xy - 8xy - 19xy + 40xy = 12xy$$

$$16. 7ab + 21ab - ab - 80ab = -53ab$$

$$17. -25xy^2 + 11xy^2 + 60xy^2 - 82xy^2 = -36xy^2$$

$$18. -72ax + 87ax - 101ax + 243ax = 157ax$$

$$19. -82bx - 71bx - 53bx + 206bx = 0$$

$$20. 105a^3 - 464a^3 + 58a^3 + 301a^3 = 0$$

$$21. \frac{1}{2}x - \frac{1}{3}x + \frac{1}{4}x - \frac{1}{5}x = \frac{30-20+15-12}{60}x = \frac{13}{60}x$$

$$22. \frac{1}{3}y - \frac{1}{3}y + \frac{1}{6}y - \frac{1}{12}y = \frac{4-4+2-1}{12}y = \frac{1}{12}y$$

$$23. \frac{3}{5}a^2b - \frac{1}{6}a^2b + \frac{1}{3}a^2b - a^2b \\ = \frac{18-5+10-30}{30}a^2b = -\frac{7}{30}a^2b$$

$$24. -\frac{5}{6}ab^2 - \frac{1}{6}ab^2 + ab^2 - \frac{3}{8}ab^2 \\ = \frac{-20-4+24-9}{24}ab^2 = -\frac{9}{24}ab^2 = -\frac{3}{8}ab^2$$

$$25. -a+8a-11a+15a-75a=-64a$$

$$26. -7c+21c+14c-30c+82c=80c$$

$$27. -mn+14mn-3mn-mn+20mn=mn$$

$$28. a^2y-7a^2y-93a^2y+51a^2y+48a^2y=0$$

$$29. -a+a-a+a-3a+6a=3a$$

$$30. \frac{1}{2}x + \frac{2}{3}x - \frac{7}{6}x + \frac{1}{2}x - x \\ = \frac{3+4-7+3-6}{6}x = -\frac{3}{6}x = -\frac{1}{2}x$$

$$31. -2x + \frac{3}{4}x + \frac{1}{4}x + x - \frac{5}{6}x \\ = \frac{-48+18+6+24-20}{24}x = -\frac{20}{24}x = -\frac{5}{6}x$$

$$32. 7a^x - 30a^x - 41a^x - 9a^x + 73a^x = 0$$

$$33. -a^{x+1} + 7a^{x+1} - 11a^{x+1} - 20a^{x+1} + 26a^{x+1} = a^{x+1}$$

$$34. a+6a-20a+150a-80a+31a=88a$$

$$35. -9b-11b-17b-81b-b+110b=-9b$$

$$36. -a^2b+15a^2b+a^2b-85a^2b-131a^2b+39a^2b=-162a^2b$$

$$37. 84m^2x-501m^2x-604m^2x-715m^2x+231m^2x+165m^2x \\ = -1340m^2x$$

$$38. \frac{5}{6}a^3b^2 + \frac{2}{3}a^3b^2 - \frac{1}{4}a^3b^2 - \frac{5}{8}a^3b^2 + 4a^3b^2 \\ = \frac{20+16-6-15+96}{24}a^3b^2 = \frac{111}{24}a^3b^2 \\ = \frac{37}{8}a^3b^2 = 4\frac{5}{8}a^3b^2$$

$$39. 40a-81a+130a+41a-83a-91a+16a=-28a$$

$$40. -21ab+52ab-60ab+84ab-31ab-ab-23ab=0$$

## EJERCICIO 10

$$1. 7a+6a-9b-4b \\ 7a+6a=13a \quad -9b-4b=-13b \\ =13a-13b$$

$$2. a+b-c-b-c+2c-a \\ a-a=0 \quad b-b=0 \quad -c-c+2c=0 \\ =0$$

$$3. 5x-11y-9+20x-1-y \\ 5x+20x=25x \quad -11y-y=-12y \quad -9-1=-10 \\ =25x-12y-10$$

$$4. -6m+8n+5-m-n-6m-11 \\ -6m-m-6m=-13m \quad 8n-n=7n \quad 5-11=-6 \\ =-13m+7n-6$$

$$5. -a+b+2b-2c+3a+2c-3b \\ -a+3a=2a \quad b+2b-3b=0 \quad -2c+2c=0 \\ =2a$$

$$6. -81x+19y-30z+6y+80x+x-25y \\ -81x+80x+x=0 \quad 19y+6y-25y=0 \quad -30z \\ =-30z$$

$$7. 15a^2-6ab-8a^2+20-5ab-31+a^2-ab \\ 15a^2-8a^2+a^2=8a^2 \\ -6ab-5ab-ab=-12ab \quad 20-31=-11 \\ =8a^2-12ab-11$$

$$8. -3a+4b-6a+81b-114b+31a-a-b \\ -3a-6a+31a-a=21a \\ 4b+81b-114b-b=-30b \\ =21a-30b$$

$$9. -71a^3b-84a^4b^2+50a^3b+84a^4b^2-45a^3b+18a^3b \\ -71a^3b+50a^3b-45a^3b+18a^3b=-48a^3b \\ -84a^4b^2+84a^4b^2=0 \\ =-48a^3b$$

$$10. -a+b-c+8+2a+2b-19-2c-3a-3-3b+3c \\ -a+2a-3a=-2a \quad b+2b-3b=0 \\ -c-2c+3c=0 \quad 8-19-3=-14 \\ =-2a-14$$

$$\begin{aligned}
 11. \quad & m^2 + 71mn - 14m^2 - 65mn + m^2 - m^2 - 115m^2 + 6m^2 \\
 & m^2 + 6m^2 = 7m^2 \qquad m^2 - 14m^2 - m^2 - 115m^2 = -129m^2 \qquad 71mn - 65mn = 6mn \\
 & = 7m^2 - 129m^2 + 6mn
 \end{aligned}$$

$$\begin{aligned}
 12. \quad & x^4y - x^3y^2 + x^2y - 8x^4y - x^2y - 10 + x^3y^2 - 7x^3y^2 - 9 + 21x^4y - y^3 + 50 \\
 & x^4y - 8x^4y + 21x^4y = 14x^4y \qquad -x^3y^2 + x^3y^2 - 7x^3y^2 = -7x^3y^2 \\
 & x^2y - x^2y = 0 \qquad -y^3 \qquad -10 - 9 + 50 = 31 \\
 & = 14x^4y - 7x^3y^2 - y^3 + 31
 \end{aligned}$$

$$\begin{aligned}
 13. \quad & 5a^{x+1} - 3b^{x+2} - 8c^{x+3} - 5a^{x+1} - 50 + 4b^{x+2} - 65 - b^{x+2} + 90 + c^{x+3} + 7c^{x+3} \\
 & -8c^{x+3} + c^{x+3} + 7c^{x+3} = 0 \qquad -3b^{x+2} + 4b^{x+2} - b^{x+2} = 0 \qquad 5a^{x+1} - 5a^{x+1} = 0 \qquad -50 - 65 + 90 = -25 \\
 & = -25
 \end{aligned}$$

$$\begin{aligned}
 14. \quad & a^{m+2} - x^{m+3} - 5 + 8 - 3a^{m+2} + 5x^{m+3} - 6 + a^{m+2} - 5x^{m+3} \\
 & -x^{m+3} + 5x^{m+3} - 5x^{m+3} = -x^{m+3} \qquad a^{m+2} - 3a^{m+2} + a^{m+2} = -a^{m+2} \qquad -5 + 8 - 6 = -3 \\
 & = -x^{m+3} - a^{m+2} - 3
 \end{aligned}$$

$$\begin{aligned}
 15. \quad & 0,3a + 0,4b + 0,5c - 0,6a - 0,7b - 0,9c + 3a - 3b - 3c \\
 & 0,3a - 0,6a + 3a = 2,7a \qquad 0,4b - 0,7b - 3b = -3,3b \qquad 0,5c - 0,9c - 3c = -3,4c \\
 & = 2,7a - 3,3b - 3,4c
 \end{aligned}$$

$$\begin{aligned}
 16. \quad & \frac{1}{2}a + \frac{1}{3}b + 2a - 3b - \frac{3}{4}a - \frac{1}{6}b + \frac{3}{4} - \frac{1}{2} \\
 & \frac{1}{2}a + 2a - \frac{3}{4}a = \frac{2+8-3}{4}a = \frac{7}{4}a \qquad \frac{1}{3}b - 3b - \frac{1}{6}b = \frac{2-18-1}{6}b = -\frac{17}{6}b \qquad \frac{3}{4} - \frac{1}{2} = \frac{3-2}{4} = \frac{1}{4} \\
 & = \frac{7}{4}a - \frac{17}{6}b + \frac{1}{4}
 \end{aligned}$$

$$\begin{aligned}
 17. \quad & \frac{3}{5}m^2 - 2mn + \frac{1}{10}m^2 - \frac{1}{3}mn + 2mn - 2m^2 \\
 & \frac{3}{5}m^2 + \frac{1}{10}m^2 - 2m^2 = \frac{6+1-20}{10}m^2 = -\frac{13}{10}m^2 \qquad -2mn - \frac{1}{3}mn + 2mn = \frac{-6-1+6}{3}mn = -\frac{1}{3}mn \\
 & = -\frac{13}{10}m^2 - \frac{1}{3}mn
 \end{aligned}$$

$$\begin{aligned}
 18. \quad & -\frac{3}{4}a^2 + \frac{1}{2}ab - \frac{5}{6}b^2 + 2\frac{1}{3}a^2 - \frac{3}{4}ab + \frac{1}{6}b^2 - \frac{1}{3}b^2 - 2ab \\
 & -\frac{3}{4}a^2 + \frac{7}{3}a^2 = \frac{-9+28}{12}a^2 = \frac{19}{12}a^2 \qquad \frac{1}{2}ab - \frac{3}{4}ab - 2ab = \frac{2-3-8}{4}ab = -\frac{9}{4}ab \\
 & -\frac{5}{6}b^2 + \frac{1}{6}b^2 - \frac{1}{3}b^2 = \frac{-5+1-2}{6}b^2 = -\frac{6}{6}b^2 = -b^2 \\
 & = \frac{19}{12}a^2 - \frac{9}{4}ab - b^2
 \end{aligned}$$

$$19. 0,4x^2y + 31 + \frac{3}{8}xy^2 - 0,6y^3 - \frac{2}{5}x^2y - 0,2xy^2 + \frac{1}{4}y^3 - 6$$

$$0,4x^2y - \frac{2}{5}x^2y = \frac{2-2}{5}x^2y = 0$$

$$-0,6y^3 + \frac{1}{4}y^3 = \frac{-2,4+1}{4}y^3 = -\frac{1,4}{4}y^3 = -0,35y^3$$

$$= -0,175xy^2 - 0,35y^3 + 25$$

$$\frac{3}{8}xy^2 - 0,2xy^2 = \frac{3-1,6}{8}xy^2 = \frac{1,4}{8}xy^2 = 0,175xy^2$$

$$31 - 6 = 25$$

$$20. \frac{3}{25}a^{n-1} - \frac{7}{50}b^{n-1} + \frac{3}{5}a^{n-1} - \frac{1}{25}b^{n-1} - 0,2a^{n-1} + \frac{1}{5}b^{n-1}$$

$$\frac{3}{25}a^{n-1} + \frac{3}{5}a^{n-1} - 0,2a^{n-1} = \frac{3+15-5}{25}a^{n-1} = \frac{13}{25}a^{n-1}$$

$$-\frac{7}{50}b^{n-1} + \frac{1}{5}b^{n-1}$$

$$-\frac{7}{50}b^{n-1} - \frac{1}{25}b^{n-1} + \frac{1}{5}b^{n-1} = \frac{-7-2+10}{50}b^{n-1} = \frac{1}{50}b^{n-1}$$

## EJERCICIO 11

Para resolver los problemas del 1 al 18 las literales toman los siguientes valores:

$$a = 1 \quad b = 2 \quad c = 3 \quad m = 1/2 \quad n = 1/3 \quad p = 1/4$$

$$1. 3ab = 3 \cdot 1 \cdot 2 = 6$$

$$2. 5a^2b^3c = 5 \cdot 1^2 \cdot 2^3 \cdot 3 = 5 \cdot 8 \cdot 3 = 120$$

$$3. b^2mn = 2^2 \cdot \frac{1}{2} \cdot \frac{1}{3} = \frac{4}{3}$$

$$4. 24m^2n^3p = 24 \left(\frac{1}{2}\right)^2 \left(\frac{1}{3}\right)^3 \cdot \frac{1}{4} = 6 \cdot \frac{1}{27} \cdot \frac{1}{4} = \frac{6}{108} = \frac{1}{18}$$

$$5. \frac{2}{3}a^4b^3m^2 = \frac{2}{3} \cdot 1^4 \cdot 2^3 \cdot \left(\frac{1}{2}\right)^2 = \frac{2}{3} \cdot 4 \cdot \frac{1}{8} = \frac{8}{24} = \frac{1}{3}$$

$$6. \frac{7}{12}c^3p^2m = \frac{7}{12} \cdot 3^3 \cdot \left(\frac{1}{4}\right)^2 \cdot \frac{1}{2} = \frac{7}{12} \cdot \frac{189}{16} \cdot \frac{1}{2} = \frac{189}{384} = \frac{63}{128}$$

$$7. m^4n^2p^4 = \left(\frac{1}{2}\right)^4 \left(\frac{1}{3}\right)^2 \cdot \frac{1}{4} = \frac{1}{4} \cdot \frac{1}{27} \cdot \frac{1}{4} = \frac{1}{432}$$

$$8. \frac{5}{6}a^{b-1} \cdot m^{c-2} = \frac{5}{6} \cdot 1^{2-1} \cdot \left(\frac{1}{2}\right)^{3-2} = \frac{5}{6} \cdot \frac{1}{2} = \frac{5}{12}$$

$$9. \sqrt{2bc^2} = \sqrt{2 \cdot 2 \cdot 3^2} = \sqrt{4 \cdot 9} = \sqrt{36} = 6$$

$$10. 4m \cdot \sqrt[3]{12bc^2} = 4 \cdot \frac{1}{2} \cdot \sqrt[3]{12 \cdot 2 \cdot 3^2} = 2 \cdot \sqrt[3]{216} = 2 \cdot 6 = 12$$

$$11. mn \cdot \sqrt{8a^4b^3} = \frac{1}{2} \cdot \frac{1}{3} \cdot \sqrt{8 \cdot 1^4 \cdot 2^3} = \frac{1}{6} \cdot \sqrt{64} = \frac{8}{6} = \frac{4}{3}$$

$$12. \frac{4a}{3bc} = \frac{4 \cdot 1}{3 \cdot 2 \cdot 3} = \frac{4}{18} = \frac{2}{9}$$

$$13. \frac{5b^2m^2}{np} = \frac{5 \cdot 2^2 \cdot \left(\frac{1}{2}\right)^2}{\frac{1}{3} \cdot \frac{1}{4}} = \frac{20 \cdot \frac{1}{4}}{\frac{1}{12}} = \frac{5}{\frac{1}{12}} = 60$$

$$14. \frac{3}{4}b^3 = \frac{3 \cdot 2^3}{4 \cdot 3^2} = \frac{3 \cdot 8}{4 \cdot 9} = \frac{24}{36} = \frac{2}{3}$$

$$15. \frac{2m}{\sqrt{n^2}} = \frac{2 \cdot \frac{1}{2}}{\sqrt{\left(\frac{1}{3}\right)^2}} = \frac{1}{\sqrt{\frac{1}{9}}} = \frac{1}{\frac{1}{3}} = 3$$

$$16. \frac{24mn}{2 \cdot \sqrt{n^2p^3}} = \frac{24 \cdot \frac{1}{2} \cdot \frac{1}{3}}{2 \cdot \sqrt{\left(\frac{1}{3}\right)^2 \left(\frac{1}{4}\right)^3}} = \frac{\frac{24}{6}}{2 \cdot \sqrt{\frac{1}{9} \cdot \frac{1}{16}}} = \frac{4}{2 \cdot \sqrt{\frac{1}{144}}} = \frac{4}{2 \cdot \frac{1}{12}} = \frac{4}{\frac{1}{6}} = 24$$

$$17. \frac{3 \cdot \sqrt[3]{64b^3c^6}}{2m} = \frac{3 \cdot \sqrt[3]{64 \cdot 2^3 \cdot 3^6}}{2 \cdot \frac{1}{2}} = 3 \cdot \sqrt[3]{64 \cdot 8 \cdot 729} = 3 \cdot \sqrt[3]{373.248} = 3 \cdot 72 = 216$$

$$18. \frac{\frac{3}{5} \cdot \sqrt{apb^2}}{\frac{3}{2} \cdot \sqrt[3]{125bm}} = \frac{\frac{3}{5} \cdot \sqrt{1 \cdot \frac{1}{4} \cdot 2^2}}{\frac{3}{2} \cdot \sqrt[3]{125 \cdot 2 \cdot \frac{1}{2}}} = \frac{\frac{3}{5} \cdot \sqrt{\frac{4}{4}}}{\frac{3}{2} \cdot \sqrt[3]{\frac{250}{2}}} = \frac{\frac{3}{5} \cdot \sqrt{1}}{\frac{3}{2} \cdot \sqrt[3]{125}} = \frac{\frac{3}{5}}{\frac{3}{2} \cdot 5} = \frac{\frac{3}{5}}{\frac{15}{2}} = \frac{6}{75} = \frac{2}{25}$$

## EJERCICIO 12

Para resolver los problemas del 1 al 18 las literales toman los siguientes valores:

$$a = 3 \quad b = 4 \quad c = 1/3 \quad d = 1/2 \quad m = 6 \quad n = 1/4$$

$$1. a^2 - 2ab + b^2 = 3^2 - 2 \cdot 3 \cdot 4 + 4^2 = 9 - 24 + 16 = 1$$

$$2. c^2 + 2cd + d^2 = \left(\frac{1}{3}\right)^2 + 2 \cdot \frac{1}{3} \cdot \frac{1}{2} + \left(\frac{1}{2}\right)^2 = \frac{1}{9} + \frac{1}{3} + \frac{1}{4} = \frac{4+12+9}{36} = \frac{25}{36}$$

$$3. \frac{a}{c} + \frac{b}{d} = \frac{3}{\frac{1}{3}} + \frac{4}{\frac{1}{2}} = 9 + 8 = 17$$

$$4. \frac{c}{d} - \frac{m}{n} + 2 = \frac{\frac{1}{3}}{\frac{1}{2}} - \frac{6}{\frac{1}{4}} + 2 = \frac{2}{3} - 24 + 2 = \frac{2-72+6}{3} = -\frac{64}{3}$$

$$5. \frac{a^2}{3} - \frac{b^2}{2} + \frac{m^2}{6} = \frac{3^2}{3} - \frac{4^2}{2} + \frac{6^2}{6} = \frac{9}{3} - \frac{16}{2} + \frac{36}{6} = 3 - 8 + 6 = 1$$

$$6. \frac{3}{5}c - \frac{1}{2}b + 2d = \frac{3}{5} \cdot \frac{1}{3} - \frac{1}{2} \cdot 4 + 2 \cdot \frac{1}{2} = \frac{1}{5} - 2 + 1 = \frac{1-10+5}{5} = -\frac{4}{5}$$

$$7. \frac{ab}{n} + \frac{ac}{d} - \frac{bd}{m} = \frac{3 \cdot 4}{\frac{1}{4}} + \frac{3 \cdot \frac{1}{3}}{\frac{1}{2}} - \frac{4 \cdot \frac{1}{2}}{\frac{1}{6}} = \frac{12}{\frac{1}{4}} + \frac{1}{\frac{1}{2}} - \frac{2}{\frac{1}{6}} = 48 + 2 - \frac{12}{\frac{1}{6}} = 48 + 2 - \frac{144+6-1}{3} = \frac{149}{3} = 49\frac{2}{3}$$

$$8. \sqrt{b} + \sqrt{n} + \sqrt{6m} = \sqrt{4} + \sqrt{\frac{1}{4}} + \sqrt{6 \cdot 6} = 2 + \frac{1}{2} + 6 = \frac{4+1+12}{2} = \frac{17}{2} = 8\frac{1}{2}$$

$$9. c\sqrt{3a} - d\sqrt{16b^2} + n\sqrt{8d} = \frac{1}{3} \cdot \sqrt{3 \cdot 3} - \frac{1}{2} \cdot \sqrt{16 \cdot 4^2} + \frac{1}{4} \cdot \sqrt{8 \cdot \frac{1}{2}} = \frac{1}{3} \cdot 3 - \frac{1}{2} \cdot 32 + \frac{1}{4} \cdot 2 = 1 - 8 + \frac{1}{2} = \frac{2-16+1}{2} = -\frac{13}{2} = -6\frac{1}{2}$$

$$10. \frac{m^6}{d^4} = \frac{6^6}{\left(\frac{1}{2}\right)^4} = \frac{216}{\frac{1}{16}} = 216 \cdot 16 = 3.456$$



$$11. \frac{3}{4}c^2 + \frac{4n^2}{m} = \frac{3\left(\frac{1}{3}\right)^2}{4} + \frac{4\left(\frac{1}{4}\right)^2}{6} = \frac{1}{3} + \frac{1}{6} = \frac{1}{12} + \frac{1}{24} = \frac{2+1}{24} = \frac{3}{24} = \frac{1}{8}$$

$$12. \frac{4d^2}{2} + \frac{16n^2}{2} - 1 = 2 \cdot \left(\frac{1}{2}\right)^2 + 8 \cdot \left(\frac{1}{4}\right)^2 - 1 = \frac{2}{4} + \frac{8}{16} - 1 = \frac{1}{2} + \frac{1}{2} - 1 = 1 - 1 = 0$$

$$13. \frac{a+b}{c} - \frac{b+m}{d} = \frac{3+4}{1} - \frac{4+6}{1} = \frac{7}{1} - \frac{10}{1} = 21 - 20 = 1$$

$$14. \frac{b-a}{n} + \frac{m-b}{d} + 5a = \frac{4-3}{1} + \frac{6-4}{1} + 5 \cdot 3 = \frac{1}{1} + \frac{2}{1} + 15 = 4 + 4 + 15 = 23$$

$$15. \frac{12c-a}{2b} - \frac{16n-a}{m} + \frac{1}{d} = \frac{12 \cdot \frac{1}{3} - 3}{2 \cdot 4} - \frac{16 \cdot \frac{1}{4} - 3}{6} + \frac{1}{1} = \frac{4-3}{8} - \frac{4-3}{6} + 2 = \frac{1}{8} - \frac{1}{6} + 2 = \frac{3-4+48}{24} = \frac{47}{24} = 1\frac{23}{24}$$

$$16. \sqrt{4b} + \frac{\sqrt{3a}}{3} - \frac{\sqrt{6m}}{6} = \sqrt{4 \cdot 4} + \frac{\sqrt{3 \cdot 3}}{3} - \frac{\sqrt{6 \cdot 6}}{6} = \sqrt{16} + \frac{\sqrt{9}}{3} - \frac{\sqrt{36}}{6} = 4 + \frac{3}{3} - \frac{6}{6} = 4 + 1 - 1 = 4$$

$$17. \frac{\sqrt{b} + \sqrt{2d}}{2} - \frac{\sqrt{3c} + \sqrt{8d}}{4} = \frac{\sqrt{4} + \sqrt{2 \cdot \frac{1}{2}}}{2} - \frac{\sqrt{3 \cdot \frac{1}{3}} + \sqrt{8 \cdot \frac{1}{2}}}{4} = \frac{2+1}{2} - \frac{1+2}{4} = \frac{3}{2} - \frac{3}{4} = \frac{6-3}{4} = \frac{3}{4}$$

$$18. \frac{2 \cdot \sqrt{a^3 b^2}}{3} + \frac{3 \cdot \sqrt{2+d^2}}{4} - a \cdot \sqrt{n} = \frac{2 \cdot \sqrt{3^3 \cdot 4^2}}{3} + \frac{3 \cdot \sqrt{2 + \left(\frac{1}{2}\right)^2}}{4} - 3 \cdot \sqrt{\frac{1}{4}} = \frac{2 \cdot \sqrt{144}}{3} + \frac{3 \cdot \sqrt{\frac{9}{4}}}{4} - 3 \cdot \frac{1}{2}$$

$$= \frac{2 \cdot 12}{3} + \frac{3 \cdot \frac{3}{2}}{4} - \frac{3}{2} = \frac{24}{3} + \frac{\frac{9}{2}}{4} - \frac{3}{2} = 8 + \frac{9}{8} - \frac{3}{2} = 8 + \frac{9}{8} - \frac{12}{8} = \frac{64+9-12}{8} = \frac{61}{8} = 7\frac{5}{8}$$

### EJERCICIO 13

Para los problemas 1 al 24 las literales toman los siguientes valores:

$$a = 1 \quad b = 2 \quad c = 3 \quad d = 4 \quad m = 1/2 \quad n = 2/3 \quad p = 1/4 \quad x = 0$$

$$1. (a+b) \cdot c - d = (1+2) \cdot 3 - 4 = 3 \cdot 3 - 4 = 9 - 4 = 5$$

$$2. (a+b)(b-a) = (1+2)(2-1) = 3 \cdot 1 = 3$$

$$3. (b-m)(c-n) + 4a^2 = \left(2 - \frac{1}{2}\right) \left(3 - \frac{2}{3}\right) + 4 \cdot 1^2 = \left(\frac{4-1}{2}\right) \left(\frac{9-2}{3}\right) + 4 = \frac{3}{2} \cdot \frac{7}{3} + 4 = \frac{7}{2} + 4 = \frac{7+8}{2} = \frac{15}{2} = 7\frac{1}{2}$$

$$4. (2m+3n)(4p+b^2) = \left(2 \cdot \frac{1}{2} + 3 \cdot \frac{2}{3}\right) \left(4 \cdot \frac{1}{4} + 2^2\right) = (1+2)(1+4) = 3 \cdot 5 = 15$$

$$5. (4m+8p)(a^2+b^2)(6n-d) = \left(4 \cdot \frac{1}{2} + 8 \cdot \frac{1}{4}\right) (1^2+2^2) \left(6 \cdot \frac{2}{3} - 4\right) = (2+2) \cdot 3 \cdot 0 = 0$$

$$6. (c-b)(d-c)(b-a)(m-p) = (3-2)(4-3)(2-1)\left(\frac{1}{2}-\frac{1}{4}\right) = 1 \cdot 1 \cdot 1 \left(\frac{2-1}{4}\right) = \frac{1}{4}$$

$$7. b^2(c+d) - a^2(m+n) + 2x = 2^2(3+4) - 1^2\left(\frac{1}{2} + \frac{2}{3}\right) + 2 \cdot 0 = 4 \cdot 7 - \left(\frac{3+4}{6}\right) = 28 - \frac{7}{6} = \frac{168-7}{6} = \frac{161}{6} = 26\frac{5}{6}$$

$$8. 2mx + 6(b^2 + c^2) - 4d^2 = 2 \cdot \frac{1}{2} \cdot 0 + 6(2^2 + 3^2) - 4 \cdot 4^2 = 6(4+9) - 4 \cdot 16 = 6 \cdot 13 - 64 = 78 - 64 = 14$$

$$9. \left(\frac{8m}{9n} + \frac{16p}{b}\right)a = \left(\frac{8 \cdot \frac{1}{2}}{9 \cdot \frac{2}{3}} + \frac{16 \cdot \frac{1}{4}}{2}\right) \cdot 1 = \frac{4}{18} + \frac{4}{2} = \frac{4}{6} + 2 = \frac{2}{3} + 2 = \frac{2+6}{3} = \frac{8}{3} = 2\frac{2}{3}$$

$$10. x + m(a^b + d^c - c^a) = 0 + \frac{1}{2}(1^2 + 4^2 - 3^1) = \frac{1}{2}(1 + 16 - 3) = \frac{1}{2} \cdot 14 = 7$$

$$11. \frac{4(m+p)}{a} + \frac{a^2 + b^2}{c^2} = \frac{4\left(\frac{1}{2} + \frac{1}{4}\right)}{1} + \frac{1^2 + 2^2}{3^2} = 4\left(\frac{3}{4}\right) + \frac{1+4}{9} = 4 \cdot \frac{3}{4} + \frac{5}{9} = \frac{3}{1} + \frac{5}{9} = \frac{27}{9} + \frac{5}{9} = \frac{32}{9} = 3\frac{5}{9}$$

$$12. (2m+3n+4p)(8p+6m-4m)(9n+20p) \\ = \left(2 \cdot \frac{1}{2} + 3 \cdot \frac{2}{3} + 4 \cdot \frac{1}{4}\right) \left(8 \cdot \frac{1}{4} + 6 \cdot \frac{2}{3} - 4 \cdot \frac{1}{2}\right) \left(9 \cdot \frac{2}{3} + 20 \cdot \frac{1}{4}\right) = (1+2+1)(2+4-2)(6+5) = 4 \cdot 4 \cdot 11 = 176$$

$$13. c^2(m+n) - d^2(m+p) + b^2(n+p) \\ = 3^2\left(\frac{1}{2} + \frac{2}{3}\right) - 4^2\left(\frac{1}{2} + \frac{1}{4}\right) + 2^2\left(\frac{2}{3} + \frac{1}{4}\right) = 9 \cdot \frac{7}{6} - 16 \cdot \frac{3}{4} + 4 \cdot \frac{11}{12} = \frac{21}{2} - 12 + \frac{44}{12} = \frac{126-144+44}{12} = \frac{26}{12} = 2\frac{1}{3} = 2\frac{1}{3}$$

$$14. \left(\frac{\sqrt{c^2+d^2}}{a} + \frac{2}{\sqrt{d}}\right)m = \left(\frac{\sqrt{3^2+4^2}}{1} + \frac{2}{\sqrt{4}}\right) \cdot \frac{1}{2} = \left(\frac{\sqrt{9+16}}{1} + \frac{2}{2}\right) \cdot \frac{1}{2} = \left(\frac{\sqrt{25}}{1} + \frac{2}{2}\right) \cdot \frac{1}{2} = 5 \cdot \frac{1}{2} = \frac{5}{2} = 2\frac{1}{2}$$

$$15. (4p+2b)(18n-24p) + 2(8m+2)(40p+a) \\ = \left(4 \cdot \frac{1}{4} + 2 \cdot 2\right) \left(18 \cdot \frac{2}{3} - 24 \cdot \frac{1}{4}\right) + 2\left(8 \cdot \frac{1}{2} + 2\right) \left(40 \cdot \frac{1}{4} + 1\right) = (1+4)(12-6) + 2(4+2)(11) = 5 \cdot 6 + 2 \cdot 66 = 30 + 132 = 162$$

$$16. \frac{a+\frac{d}{b}}{d-b} \cdot \frac{5+\frac{2}{m^2}}{p^2} = \frac{1+\frac{4}{2}}{4-2} \cdot \frac{5+\frac{2}{\left(\frac{1}{2}\right)^2}}{\left(\frac{1}{4}\right)^2} = \frac{2+4}{2} \cdot \frac{5+\frac{2}{\frac{1}{4}}}{\frac{1}{16}} = \frac{6}{2} \cdot \frac{5+8}{\frac{1}{16}} = \frac{3}{2} \cdot \frac{5+8}{\frac{1}{16}} = \frac{3}{2} \cdot \frac{13}{\frac{1}{16}} = \frac{3}{2} \cdot 208 = \frac{624}{2} = 312$$

$$17. (a+b) \cdot \sqrt{c^2+8b} - m \cdot \sqrt{n^2} = (1+2) \cdot \sqrt{3^2+8 \cdot 2} - \frac{1}{2} \cdot \sqrt{\left(\frac{2}{3}\right)^2} = 3 \cdot \sqrt{25} - \frac{1}{2} \cdot \frac{2}{3} = 3 \cdot 5 - \frac{2}{6} = 15 - \frac{2}{6} = \frac{90-2}{6} = \frac{88}{6} = 14\frac{4}{3} = 14\frac{1}{3}$$

$$18. \left(\frac{\sqrt{a+c}}{2} + \frac{\sqrt{6n}}{b}\right) + (c+d) \cdot \sqrt{p} = \left(\frac{\sqrt{1+3}}{2} + \frac{\sqrt{6 \cdot \frac{2}{3}}}{2}\right) + (3+4) \cdot \sqrt{\frac{1}{4}} = \left(\frac{\sqrt{4}}{2} + \frac{\sqrt{4}}{2}\right) + 7 \cdot \frac{1}{2} = \frac{2}{2} + \frac{2}{2} + \frac{7}{2} = \frac{4}{2} + \frac{7}{2} = \frac{11}{2} = 5\frac{1}{2}$$

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